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ABSTRACT

This paper presents a moderately detailed overview of research and development needs through an analysis of past, current, and planned research efforts, in conjunction with recommendations of a sociological, political, and moral nature. This approach is in line with pleas for more comprehensive theories and for assessment and programming which take into account the whole child in his total life space. There is also an interest in using research and development techniques which will give us more differentiated programs and results. Finer breakdowns of such population groups as the disadvantaged, the handicapped, and the gifted are called for. More instruction to meet individual needs and abilities, and programs and tests which are relevant to particular cultural and ethnic backgrounds are urged. In summary, then, the major directives for the future are for an increasingly holistic, broad-range, integrated overall framework within which methods are used which result in increasingly focused programs. (Author/CS)

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EARLY CHILDHOOD

RESEARCH AND DEVELOPMENT

NEEDS, GAPS, AND IMBALANCES:

OVERVIEW

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Introduction

Purpose and Sources of Information

The purpose of this paper is to present a moderately detailed overview of needs, gaps, and imbalances in early childhood research and development.

Two kinds of information may enter into the identification of research and development needs, gaps, and imbalances: a) knowledge of past, current, and planned research and development efforts, and b) judgments of a sociological, political, and moral nature. Recommendations coming from each of these kinds of information may overlap, conflict, or merely address themselves to different areas. Therefore, it is important to consider both kinds of information in identifying research and development needs, gaps, and imbalances.

In preparing this paper, sources of information were chosen so that research and development efforts, including plans for FY 1973, and judgments relevant thereto were taken into account. The list of references used, which appears at the end of the paper, consists of recent state of the arts and position papers, such as Cognitive and Mental Development in the First Five Years of Life and Research Directions for the 70's in Child Development. It also includes the Report to the President - White House Conference on Children 1970 and the recent report of the Interagency Panel on Early Childhood Research and Development entitled Toward Interagency Coordination.

This overview of early childhood research and development needs, gaps, and imbalances is to be supplemented in the near future by specific information about FY 1970 and 1971 federally funded research and development in some of the gap areas discussed in the present paper.

Organization of the Paper

Preceding the body of the paper is a summary and highlights list of recommended future directions in early childhood research and development. This list consists of recommendations which a) were widely mentioned, and/or b) represent an area in which nothing or almost nothing has been done as yet, and/or c) are innovative suggestions or perspectives. These recommendations appear in more developed form within the body of the paper.

The body of the paper covers five dimensions of research and development.

- a) Kinds of research and development -- basic, programmatic, evaluation, methodological, dissemination, and planning.
- b) Research scope -- longitudinal research and population sampling.
- c) Developmental process areas -- whole child; and cognitive, social-emotional, and physical development.
- d) Environmental influences -- society at the national and international level, the family, education, social and health programs and institutions, child advocacy, and total life space.
- e) Population characteristics -- age, sex, socio-economic status and ethnic characteristics, geographic location, and capabilities.

Most research and development needs, gaps, or imbalances involve more than one of the five research and development dimensions covered in the paper. For example, a need for basic studies of verbal communication in middle and upper class families involves the dimensions of kinds of research and development (basic), developmental process areas (cognitive and social-emotional development), environmental influences (family), and population characteristics (socio-economic status). In order to limit repetition, a need, gap or imbalance was discussed in detail only within the one dimension to which it seemed most specifically and/or centrally related. If it was referred to at all within the other dimensions relevant to it, the reference was more general in nature.

Summary and Highlights of Recommended Directions for
Early Childhood Research and Development

- Increased cooperation and coordination between applied and basic research efforts.
- More collaborative research efforts.
- Conceptual integration, as by synthesis of research findings and more comprehensive theory.
- Improved dissemination of research results to other researchers, program people, and the public.
- Longitudinal studies of development and the effects of environmental influences, including the effects of applied programs.
- Study of the development of and environmental influences which affect individuals below 3 years and in the middle years of life, females, those from middle and upper income backgrounds, and those of average and above average abilities.
- Multi-faceted intervention programs and different combinations of program facets.
- More emphasis on implementing environmental change in addition to efforts at directly effecting changes in behavior.
- Study of the impact on child development of programmed and naturally occurring environmental change.
- Ecological study of natural settings and applied programs.
- More flexible evaluation schedules and techniques in applied programs.
- More analysis of contingencies between environmental events and behavior, in natural settings and in applied programs.
- More consideration of individual differences in the development and analysis of applied programs.
- Look at latent, unintended and potential harmful effects of applied programs.
- Assessment of the whole child.
- Study total life space.
- Clarify the components and sequential steps of cognitive development and the precursors thereof.

Clarify the subprocesses of learning and thinking skills and identify optimal learning situations for various skills.

Clarify and validate objectives and standards of education.

Broaden the goals of education.

Study the relation between school practices and tests and extra-school demands.

Develop measures of the learning process, including measures of various problem-solving skills and attitudes.

Further development and use of individualized instruction.

Study the effects of educational technology, as programmed learning, computer-assisted learning, and TV.

Further development of training and selection procedures for teachers and child care workers.

Determine the norms of social-emotional development.

Research on the situational generality, stability over time, and changeability of social-emotional characteristics.

Study of the development of values.

Study the role of play and pleasure in development.

Develop additional measures in the social-emotional domain.

Detailed study of social interaction processes, including those within social systems of more than two persons.

Study effect of separation from parents.

Study the effect of the family on child development, including families of various forms.

Further development and study of parenthood training.

Study the effect of peers on child development.

Study experimenter effects.

Heritability studies on developmental measures within and between various population groups.

Study of genetic variation and aberration.

Further development of methods for decreasing the infant mortality rate.

Further study of the relation between nutrition and cognitive development.

Study the effects of helping organizations on clients.

Further study of the effects of day care on children and families.

Further development and assessment of child advocacy programs.

Increased study of the development of sexual identity.

Look at the heterogeneity of the population of disadvantaged.

Study successful individuals from apparently disadvantaged backgrounds.

Increase the ethnic relevance of educational and social programs.

Study the effects of socio-economic and/or ethnic mix.

Study the relation between integration and cultural identity.

Study the effects of rural, urban and suburban environments.

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Kinds of Research and Development

Basic Research

Conflicting recommendations were made in relation to the proportion of the research dollar going to basic research. While some recommend decreasing the percentage of support to basic research, others warn that we must not allow basic research to fall out of favor.

It was noted that basic research is beginning to occur more often in natural settings. A need for more basic research on the effects of various environmental influences was indicated. Recommendations were also made for more studies which include both basic and applied research components.

Programmatic Research

Amount

There is currently a shift in emphasis from basic to applied research. Recommendations have been made to increase even further the proportion of research and development funds devoted to applied research.

Scope and Design

There is wide agreement that there has been enough, or too much, applied research involving isolated programs of gross, single-faceted intervention. What we need more of are intervention programs which are wider in scope and/or more focused in design and evaluation.

It is recommended that compensatory education programs continue longer beyond the preschool years, increase the extent of genuine variation between programs, and raise the potential magnitude of their impact by increasing the duration of the program per day or week and by refining program content. Present Planned Variation and Follow Through programs are efforts in these directions.

It is also widely recommended that we evaluate compensatory education programs in terms of what works for whom. We should then design alternative compensatory education programs to fit individual differences of children and teachers.

Alternatives to day care centers and nursery schools are being developed, such as training parents to be teachers of their own children, preparing

older children to teach younger children, educating teenagers in preparation for parenthood and combining home care, out-of-home care, and parent education programs in various ways. While promising research is underway in some of these areas, far more is needed, especially that which focuses on the costs and benefits of these programs relative to each other and relative to day care and nursery school programs.

A distinction has been made between trying to change behavior directly and changing environmental circumstances in order to improve life outcomes. It is suggested that we should concentrate more on the latter and less on the former than we have up to now. For instance, it was suggested that we attempt to find out what the classes of reinforcers are for various groups of people and what the optimal scheduling of such reinforcers would be. Related to this suggestion is that of using a classification rather than a selection model in areas such as education, training, and job programs. Programs would be set up to fit the individual needs and abilities of each person rather than gearing the programs for a few selected groups. Mention was made of many possible social programs or reforms to change people's environment: changing the training and recruitment of teachers, the control and bureaucratic posture of public schools, neighborhood residential patterns, public housing, job requirements, the job market, welfare administration, the organization of helping and health institutions, and the organization of the law enforcement system; and using peer group influences, supportive services, income maintenance, and busing.

When such social intervention or reform programs as those listed above have been tried, their impact upon child development has seldom been assessed. It was urged by several sources that there be comparisons in terms of impact on child development between various social and educational intervention or reform programs. Development of broad programs which involve simultaneous intervention in many life areas has increased but is in need of further expansion. The effects of different combinations of intervention should be compared.

The Designing Process

Ideally, applied programs should be attempted using a relatively small proportion of the population before being launched on a large scale basis. It is recommended that close coordination be maintained between program and

research personnel in planning, carrying out, and evaluating applied programs.

It was suggested that in action programs we should move from strictly pre-post measures to using quality control -- changing a program according to how it is going, before the end of the program, while keeping track of such program changes.

Evaluation

Timing of the Evaluative Effort

The above suggestion of a change from strict pre-post evaluation to evaluating and modifying a program while it is in operation is one of several suggestions calling for more flexible evaluation schedules. One source noted that the demand for measurable proof of progress in early education programs has often led researchers to use problematic assessment techniques which were readily at hand rather than take the time to develop more satisfactory measures. It has also led to the research framework and techniques becoming the primary determinant of the curriculum. The suggestion was made to defer formal evaluation of a new program for a certain number of years. This would allow time for program development while also providing for a "pure" test of the program once it had been developed.

Level of Analysis

A very frequent suggestion is that global assessment of applied programs be supplemented by more detailed analyses. We must isolate critical variables within programs and contingencies between them and behavioral outcomes. We must look for different input-outcome contingencies for different individuals in the program.

Latent or Unintended Effects

Action programs should be undertaken with an awareness of the possibilities of latent, unintended and perhaps harmful effects. Widely spaced dependent variables should be included in evaluative research in order to monitor unintended consequences. Follow-up assessment is necessary to detect latent effects of the program which do not manifest themselves until after the child has left the program.

Sources of Data

Efforts at pooling evaluation data from various intervention programs could give us a broader, more coordinated data base. Exploration of such an undertaking has been begun in the last few years by a consortium of persons engaging in infant intervention research.

One source called for a mechanism for systematic reporting and analyzing of various health and health service statistics. Another source recommended that the larger institutions in our society such as schools, hospitals, and industry be encouraged to maintain records on individuals passing through their institutions and allow researchers to have access to these data. Such data could be used to indicate outcomes of previous life events as well as precursors of later life outcomes.

Methodological Research

Need for New Instruments

A great need for instrument development was mentioned in several references. This need for instrument development extends from mapping the environment to assessing cognitive, social-emotional, and physical characteristics of individuals.

Ecological Studies and Concerns

In addition to attempts at changing people's life circumstances, researchers need to study the characteristics and events within natural settings. We need far more accurate, detailed descriptions and quantitative measurements of the environments of various groups of people in order to supplement the intuitive and broad descriptive standards which we now use. Metrics for mapping the environment are underdeveloped. The interacting elements of the environment and response properties of the individual need to be more adequately specified. For this purpose we need to further develop and refine behavioral observation techniques. At present such techniques are idiosyncratic and all too sporadically employed.

Environmental mapping and behavioral observation techniques would be useful not only in natural settings but also in structured settings. Such techniques could aid in efforts to identify program input-behavioral outcome contingencies within applied programs.

There are further ecological considerations which enter into developmental and program assessment. Assessment techniques and settings which have little or no relation to the tasks and contexts of people's every day lives are not valid indicators of people's abilities and characteristics. For example, it is urged that psycholinguistic tests given to ghetto children in school situations should be supplemented by tests of language ability in settings more typical for these children. In assessing intellectual achievement in disadvantaged adults, it is recommended that there be further development and wider use of tests with content and tasks which are natural or "indigenous" to the lives of these adults.

Whole Child

There is a widely acknowledged need to study the "whole child." This could involve using a broader range of assessment techniques, many of which will have to be developed. It could involve assessing patterns and interactions between different abilities and characteristics. It might also involve devising wholly new kinds of single measures which would provide a fuller picture of an individual than previous single measures.

Cognitive and Social-Emotional Development

A broader conception of cognition is emerging. Attention is being given to assessing the learning process rather than just products. Processes and traits which have both cognitive and social-emotional aspects are being considered, such as creativity, language, self-concept, values, and motives. The socialization process is also receiving more interest.

All of these areas of interest call for new assessment instruments and measures. Measures are especially needed in the affective and social domains. Within these domains, measures are particularly scarce for children under 3 years and for adults.

Development of assessment measures for adults is important in several areas of early childhood research and development. New ways of measuring family characteristics are needed. Selection procedures for hiring child care workers need to be developed. Criteria of adult success are needed in order to test the validity of educational practices and to assess later effects of early life experiences.

Physical Development

Within the domain of physical development, recommendations were made for the use of certain research methodology and for increased work on particular assessment measures. It was suggested that we need methodologically and genetically sophisticated heritability studies of most of the measures we use in developmental research. We need work in developing measures of the health and nutritional status of families. There is a need for further definition in terms of the reliability and validity of screening tests used to identify health problems.

Dissemination

Efforts are greatly needed to increase and improve research dissemination methods other than formal training. There needs to be improved dissemination of information between different researchers and between researchers and their publics. We need to employ better means of communication between researchers and program developers.

New roles within the social sciences which would facilitate research dissemination were suggested: an information synthesizer who would correlate findings in major fields in an organized and systematic way so that knowledge would be in a more usable and accessible form, an information specialist who would translate the language of the researcher into the language of the policy maker and consumer, and a social science engineer who would creatively design applied programs in light of basic research findings.

Planning

Need for Synthesis and Conceptual Guidelines

In both basic and applied research there is a need for a) more synthesis of present knowledge and for b) increased development of guidelines in the form of theories and objectives.

We need to synthesize the information gained not only by researchers but also by field workers. A suggestion has been made for developing the special job category of information synthesizer.

Concerning the need for theory development, we especially need more comprehensive theory. A theory comprehensive enough to differentiate the environment system, the person system, and the behavior system would enable

systematic relationships to be pursued rather than the ad hoc ones presently involved in so much of the research. It would also provide a logical basis for devising measurement instruments and for making systematic tests of relationships among variables.

The need for clarification and validation of objectives in education was frequently mentioned. This is the case at all levels of the educational system and in compensatory education programs. There is also a need for the study of goals for child development as a whole.

Cooperation and Coordination

More cooperation and coordination is urged between research and program personnel, between researchers in the same field, and between researchers in different fields.

There were some suggestions which relate to the need to facilitate transposing information gained from basic research into practical and useful programs. It was recommended that there be close coordination between program and research personnel in planning and carrying out the treatment and study phases of an applied research program. One source suggested the role of social science engineer, who would creatively design practical applications stemming from basic research findings.

More collaborative research efforts were urged between researchers in the same field and in different fields. It was noted, however, that collaboration for its own sake is not good. Only when a problem can be best attacked through collaboration should this be pursued. Efforts to collaborate have been relatively few because of the many problems involved, which include those concerning spatial organization, professional conflicts, locus and means of decision-making, and personality conflicts. However, such problems are not insurmountable. Various measures related to funding, training and conferences have been suggested to facilitate collaboration. It was also pointed out that there are many possible levels of collaboration. Short of researchers planning and working on one project together, they might, for example, coordinate the planning and/or evaluation of separate projects. Increasing coordination of experimental procedures and/or measurement instruments used in different projects and studies would be one way of increasing the comparability of their results.

Research Scope

Longitudinal Research

Broad suggestions for more longitudinal research in all areas of development and in all types of applied programs are abundant.

In relation to the developmental processes, our knowledge about the long-range course of development is especially lacking in the area of social-emotional development.

It has often been stated that we need applied programs which serve children and families for a greater number of years and which assess program effects for a longer period of time. Recent intervention programs are responding to these needs. The age levels for which intervention is provided are being extended both downwards and upwards. We have yet to determine, however, what kinds of differences, if any, earlier intervention makes and if there is a "point of diminishing returns" in upward age extensions of intervention.

Some suggestions were made concerning the breadth of the sample involved in longitudinal studies. A special need for longitudinal study of social-emotional development across different social classes and ethnic groups was noted. There are presently several longitudinal studies focusing upon blacks but very few if any focusing upon American Indians, Spanish-Americans, or Oriental Americans.

Population Sampling

Further consideration is needed in relation to determining a fair distribution of funds for child development programs and research across socio-economic levels and cultural and ethnic backgrounds.

Certain population groups were specifically mentioned as needing additional study. Having received such mention are children below 3 years of age, individuals in the middle years of life, females, average income and upper income children, children of normal ability, and gifted children.

Developmental Process Areas

Whole Child

Assessment

More stress is being put upon the need to assess the cognitive, social-emotional, and physical aspects of a child and the patterns of and interactions between these various aspects. Steps are being taken along these lines, but much more needs to be done. For instance, there is growing interest in characteristics which seem to involve more than one of the above three aspects of the child, characteristics such as impulse-control, self-concept, motivation, esthetic and ethical values. Much more work is needed on all such characteristics. Many studies are now using a fairly wide range of assessment techniques, but as yet there have been relatively few attempts to look at patterns of and interactions between scores on different measures, particularly in applied research.

One source mentioned the need to use a holistic assessment approach in the specific case of studying fetal development. It was suggested that in order to increase our understanding of fetal development, we should look at the occurrence of and the interrelationships between histological, chemical, neurological, and behavioral changes.

Programs

The need for a holistic approach is relevant to social and educational programs. The main focus of the educational system of this country has been, and for the most part still is, on cognitive development. This has also been the area of focus of many early childhood intervention programs. Even when intervention programs have services other than those aimed at cognitive development, the impact of these other services on child development has seldom been assessed. It is widely suggested that the goals of cognitive, social-emotional, and physical development and subsequent adult competence be adopted by the educational system and intervention programs. The effects of diverse components of these programs on child development should be assessed.

Cognitive Development

Conceptualization of Cognition and Cognitive Development

Cognition and cognitive development have been conceptualized in terms of broad theories and in terms of various traits and skills. Additional work is needed in refining, testing, and integrating the various conceptions of cognition and cognitive development.

We need further systematic tests of cognitive theories such as those of Piaget, Bruner, and Gagne. We also need to try to resolve discrepancies between different cognitive theories. Far more efforts are needed at trying to integrate cognitive theory with theories of social and emotional development.

A broad range of traits and skills are now being considered within the domain of cognition. Many of these involve physical and/or social-emotional aspects of the child. Traits and skills mentioned within the domain of cognition include curiosity, initiative, reactivity, attentional style, task orientation, learning styles, reflectiveness, flexibility, creativity, organization, planning, memory, verbal and nonverbal mediation, language development and reading. In addition to such traits and skills as the above, subprocesses of learning and thinking skills need further identification. One source suggested the following steps as a procedure for doing this: interview people who are proficient at a task to find out how they did the task; from information thus gained, hypothesize about the necessary and sufficient conditions for doing the task; and then test the validity of these hypotheses by instituting these conditions for people who are typically not very proficient at the task.

The above traits and skills need to be explored with more consistency of method and in a broader range of situations. More attention needs to be paid to the existence and development of these traits and skills within different population groups, such as different age, socio-economic, and ethnic groups and various handicapped and gifted groups. We also need to look further at patterns of abilities in different groups. Findings from research on these traits and skills need to be integrated with each other and with cognitive theories.

Biological and Environmental Influences

We need additional investigation of biological influences on cognitive

development and the interaction of these influences with those of the environment. For example, we need further consideration of the physiological, biochemical, and genetic factors that underlie learning ability. This would include additional study of how genetic endowment interacts with environmental input to determine intelligence and learning outcomes. The relationship between various physical growth indices and measures of mental development needs to be studied within and between various socioeconomic and racial groups. We need more information on the relationship of nutrition and eating habits to cognitive development, especially with respect to marginal protein deficiency. The kinds and amounts of food necessary to correct anemia and enhance intellectual performance need to be determined.

We are just beginning to closely examine the nature of the interaction between specific features of the environment and cognitive processes. There are many broad questions along this line for which we have only very partial, if any, answers. What are the characteristics of the successful learning situation? What are the optimal learning situations for specific skills and processes? What are the limits of trainability for particular cognitive capacities? How do the timing and sequence of instruction in intellectual skills relate to characteristics of the learner, such as age, IQ, socio-economic status, and ethnicity? What is the optimal balance between familiarity and novelty for different age levels? More information is needed on variables affecting the generalizability or transferability of skills across different situations.

In addition to the many broad questions, such as the above, about the relationship between the environment and cognitive development, there are many areas of narrower focus related to this issue which have recently been receiving increased attention. The study of infant responses to sensory stimulation has greatly increased. Work along this line needs to be continued. There is a growing interest in examining how family interaction influences cognitive development. Detailed analysis of the relation between family interaction and child development needs far more work, particularly with middle and upper income families and with children older than 3 years of age. There has recently been increased attention to the cognitive demands and supports found in natural settings. Much more needs to be done along this line. We know especially little about the reinforcements for learning that exist in

the general adult population and for various subpopulations of adults such as women and the disadvantaged. Knowledge about the effects of deprivation on cognitive development is presently very global and incomplete. Most of our information on this subject is from animal studies. We have far too little understanding of how the timing of both deprivation and enrichment affect cognitive growth.

Social-Emotional Development

Conceptualization of Social-Emotional Development

One great need in investigating the organization and components of social-emotional development is for further examination of the empirical norms in this developmental area. We have more knowledge of developmental norms in the cognitive than in the social-emotional area. The importance of critical periods of growth for social-emotional development should be more carefully examined. We must give much more attention to the stability and consistency of social-emotional traits.

Besides the need for empirical knowledge about the components and sequence of social-emotional development, there is great need to revise and further develop theories and concepts in this area. Along these lines also, we are further ahead in the cognitive than in the social-emotional area. Present motivation and personality theory developed a generation ago in large measure out of a psychoanalytic and early life experience framework with an emphasis on underlying motivation and with adjustment as the index of mental health. In contrast to this framework is the newly emerging focus on self-determination and individual competence as indices of healthy development. Within either of these frameworks lie many specific traits or processes which need further study, such as motivation for achievement, attention, and affection; specific coping techniques, including those which individuals use to cope with deprivation; traits involving self-concept, such as confidence and self-worth, capacity for self-regulation, sexual and racial identity; and the emergence of intentionality and development of mastery.

There are several other emerging foci in the domain of social-emotional development, all of which need further attention. Included are the areas of values and attitudes, pleasure and play, aggression, and social relationships.

Within the area of values and attitudes, we need increased study of the development, prevention, and changeability of racism and prejudice. Many

authorities are calling for more work on value systems, including ethical, moral, and esthetic value development.

Within the area of pleasure and play, people are urging study of such feelings as peacefulness, stability, and joy. The role of play in human development needs increased attention.

The study of aggression is gaining increasing interest as the crime rate rises and as the relationship between violence in the media and aggressive behavior becomes of greater public concern. The great majority of our knowledge about aggression comes from animal studies and from laboratory studies with people. Far more work on aggression is necessary, particularly on human aggression in natural settings. The theoretical conflict of aggression as an innate drive versus aggression as a provoked and/or learned response has yet to be resolved.

Environmental Influences

Research on the effect of the environment on social-emotional development needs to encompass more of the links in the causal chain than is characteristically done at present. We need the kind of investigation which links environmental variation with variation in socialization processes, which links the latter in turn with personality variation, and which then ties personality variation to variation in behavior.

One of the most important environmental influences on social-emotional development is the "significant others" in a child's life. We need to know more about the factors which affect the strength and direction of attachments to others at various ages. More information is needed about the effects of different lengths of separation from home and parents at different ages. The role of nonparental agents in socialization, such as siblings, adult relatives, babysitters, teachers, and peers, has hardly been explored. The need to study the effect of peers on child development was especially stressed.

A closer look at the processes involved in relating to others was recommended in several references. We need systematic studies of behavioral interactions, especially as they occur within natural settings. Direct observational and experimental studies of mother-infant interaction have increased but similar studies for those older than 3 years are rare. Very seldom has there been direct observation of father-child interaction. There has been very little work in child development on interactions within social systems more complex than the dyad. For instance, there has been very little

work on the mother-father-child triad and none on the mother-two children triad nor on the four person system of mother, father and two children. The processes involved in relating to nonparental agents also need attention. There is literature on the effect of a stranger but not on the process of familiarization.

In studying social interaction, the reciprocity of such interaction needs to be looked at. Only a few studies have analyzed mother-infant interaction as a reciprocal system. There have been no studies on infant-experimenter interaction as a reciprocal system. There has been no direct study of the child as a socializing agent. There is also a need to study the vicarious reinforcement or imitation and influence of a third party on the pattern of reciprocal interaction between two others.

Measures of interaction need to be developed. In one reference several such measures were suggested -- the probability that an act of A is directly followed by an act of B or vice versa, number of alternations in action between A and B per unit of time, and reciprocations in kind or within the same modality.

Another process involved in social-emotional development which is inherently linked to environmental influences is that of modeling or imitation. We need to know more about the past history and immediate situational conditions which foster the imitation of one type of behavior or another in children.

There are many institutions and programs which attempt to modify social-emotional behavior. At present we are faced with a great deal of unpredictability of outcome of any specific program of training and treatment for later personality and character development. Much more research is needed on the changeability of personality attributes and on what conditions and experiences are most significant as change agents.

Relation to Biological Factors

Research is needed to elucidate how genetic or biological factors interact with environmental influences in the formation of "normal" personality characteristics and various emotional disorders. One source recommended that a social psychology of morphology be developed. In other words, we might systematically explore the social definitions given to various body parameters and to changes in these with age.

Physical Development

Genetics

Behavioral geneticists should continue to advance our knowledge of the ways genetic endowment interacts with variations in the environment to explain both physical and behavioral differences. We have only touched the surface in exploring areas such as genetic variation and aberration. Wherever a clear genetic base for a physical or behavioral characteristic has been demonstrated, study of the physiological mediators of the genetic effect should be encouraged.

Fetal Development

We need further study of the course of fetal development and the effects of genetic and maternal-environmental factors on fetal development. In particular, we need further probing of how maternal nutrition, before and during pregnancy, and maternal drug abuse affect development of the fetus. The causes and correlates of prematurity, low birth weight, birth defects, and the relatively high infant mortality rate in the United States need further investigation.

Psychophysical Processes

We need to know a great deal more about the maturation and functioning of the brain in both prenatal and postnatal periods.

Sensory and perceptual processes in man have been neglected in studies of family trends or other correlational approaches. Little is known about the ecological significance and utility of the different forms of sensory-perceptual information. Further sensory deprivation studies are needed. The area of compensations for sensory deficits needs to be explored. The relation between early sensory-motor perception and later developmental processes still is not clear.

Environmental Influences

There are many environmental influences upon physical development which need further study. Specific mention was made for the need to study the effect of the child's total life space on childhood disease, the effect of post-natal nutrition on physical development, and the effect of emotional climate on physical growth.

Environmental Influences

Society at the National and International Level

The rate of change in society has been increasing and will probably continue to increase. It is important to consider how current and projected future changes affect or will affect child development.

Some of the continuous changes in our society are changes in the genetic, socio-economic and cultural makeup of the population. We need to investigate further how genetic factors affect social stratification and how social stratification affects the biological endowment of certain populations across generations. We need to carefully examine the effects on children, families, and society of efforts at racial integration, including the effects of busing. For example, in studying the effects of efforts at school integration, we need to look at the influences of type and quality of school, age of children, peer group acceptance, family background, and available supportive services.

There are many other social trends whose effects should be more closely examined and which should be taken into account in formulating goals for child development. Such trends include changes and conflicts in values and life styles, redefinition of sex roles, the changing role and structure of the family, careers for women, technologically produced obsolescence of job skills, growing emphasis on jobs requiring high verbal and symbol manipulation skills, the shrinking work week, an increasingly mobile life style, the urbanization of society, the increasing ease and speed of communication and travel, population growth, increasing availability of birth control measures, increasing knowledge and control over genetic and reproductive processes, the development of organ transplantation, growing ecological awareness, development and use of the destructive and constructive potentials of nuclear energy, changing attitudes and policies in relation to war and the military, changes in the nature of law enforcement and penal institutions, and changes in the philosophy and organization of the educational system.

The Family

Effect on Child Development

Much more investigation is needed of the way family characteristics

affect the child's total development. Study of family interaction through direct observation, particularly in natural settings, is especially recommended. We know particularly little about interactions involving fathers, family social systems involving more than two people, and family interaction in middle and upper income levels and in healthy, effective families. More study is needed of the influence of various circumstances and characteristics on family functioning, such as socio-economic status, religious and cultural values, the relationship between the parents, size of the family, parent employment, and various disabilities of one or more family members.

There is a need to study variant family forms. We could try to find out more about the incidence and prevalence of variant family forms in this country. We could try to assess the effects on children of alternatives to the nuclear family which exist in this country. More cross-cultural comparisons between various forms of family functioning in different countries is recommended. One source also recommended longitudinal studies on reducing prejudice, discrimination, and punishment toward variant family forms in this country.

Intervention

How does one go about instituting change in parental childrearing? We need to examine the availability of parent education resources and information in local communities. Techniques for training parents to use these resources are needed. Our knowledge of and efforts at training for better parenthood, both before and during parenthood, are only in an initial stage of development. More study is needed on the degree to which training for parenthood has general and long term effects on parents' child development skills.

In Relation to the Community

We need to further consider what functions related to child development are best accomplished in the home and which might be best served by other institutions. For example, what is the impact of learning at school compared to learning at home. In addition, we need to consider how family functioning might be increasingly coordinated with and/or integrated into the functioning of other social institutions. For example, in what innovative ways could communication and coordination between the home and school be increased? There have recently been some new kinds of attempts to include the family within

other social institutions, such as parent participation in the classroom within early education programs and the establishment of day care centers at parents' place of employment. More of such attempts are recommended.

Education

Goals

The need to clarify and validate objectives at all levels of education was frequently stressed.

Many recommendations have been made concerning what the objectives of the educational system should be. Many authorities suggest that the goals of the educational system should be widened to include broader cognitive goals as well as the goals of physical and social-emotional development and subsequent adult competence. One source recommended that we should have only school practices and tests which assist in meeting extra-school demands or which facilitate skills needed later for extra-school demands. Empirical investigation of the relation of present and potential school practices and tests to extra-school demands is badly needed. What kinds of abilities other than those now tested could be developed and assessed in connection with the goal of subsequent adult competence? How could we reorganize the educational system so that everyone would be prepared for successful employment and adult satisfaction?

Some authorities have recommended that we diminish or eliminate the emphasis on competence level and standards for rate of growth. They recommend instead allowing individuals to choose their own goals and rates of growth and concentrating upon providing as wide opportunities as possible for individual development.

Increased education for all ages is recommended and predicted. Universal preschool, even for children as young as 3 years of age, has been recommended. Such suggestions bring to the fore the issue of intellectual acceleration. The benefits and drawbacks of intellectual acceleration need much more careful study. In contrast to suggestions for earlier schooling, some authorities recommended delaying or eliminating formal schooling altogether.

General Features of Classroom Atmosphere and Curriculum

There are opposing views of the best educational approach. Various

people fall at different points on the continuum between a flexible, child-oriented, humanistic approach and a mechanical, rigid, IQ-oriented approach. While one source recommends an approach based on the position that learning is fundamentally a consequence of shifts in affect, another recommends cognitive-based compensatory preschool.

Systematic comparisons between different educational approaches are greatly needed. In addition to such comparisons currently being made at the preschool level, we need work along this line above the preschool level. We also need investigation of the effects of different sequences from one type of schooling to another. Perhaps the answer to the conflicts over different educational approaches will not be in terms of deciding upon the one best approach, but rather upon finding out what is best for what kinds of children and/or for what types of educational objectives.

A long-neglected but important aspect of the classroom is that of peer influence. We need to study the present effect of peers in the classroom and develop methods for making constructive use of peer influences. We also need to study the effects of particular mixtures of children in the classroom, such as various age, socio-economic, ethnic and ability mixtures.

Specific Educational Techniques

While there are quite a few explicitly designated teaching procedures for children below 1 year or above 3 years, the curricula being developed for 1 to 3 year olds are not yet generally available.

As part of the curriculum development effort at all educational levels is the need to find out more about the optimal conditions of instruction for various skills. There is a great need for detailed systematic information about what actually occurs in classrooms. Such information could be very useful in specifying productive and counter-productive educational techniques. Some curricula which can enhance cognitive development have already been identified. They must be developed and field tested more fully and information about them disseminated more widely.

It is important that education be tailored to individual needs and abilities. Not only what is taught and what instructional components are used, but also the timing and sequence of these components need to be varied for different individuals. More work is needed in designing different instruction for different individuals. For instance, we need to examine the

implications for school instruction of children's levels of associative and conceptual learning ability. How much potential for any kind of learning is there for children who are low in associative learning ability? We need highly focused and long range attempts to train specific cognitive abilities in children who are high in associative learning ability and poor in conceptual learning ability.

The use of computer-assisted programmed learning is increasing. There are many questions which need to be explored about the impact of such teaching machines. For example, what is their effect on children's initiative and individuality? Does the machine become an authority figure for the child? Does this experience affect the attitude of the child toward the whole technological system? Does programmed learning deprive the child of social competencies he should be learning? Does computer-assisted teaching contribute to an "I don't know" syndrome? Can the machine compensate for the motivational deficits of deprived children?

Individualized instruction does not necessarily mean instruction with one individual at a time. We need to study whether for some skills and some individuals a group approach is best. We also need to give further attention to different methods of group teaching.

A part of tailoring instruction to meet individual needs and abilities is making programs relevant to the ethnic background of students. The need for increased development of ethnically relevant academic content is widely recognized. The ethnic relevance of method of presentation is also an issue needing attention. For example, should one teach children standard English and present all academic content in standard English or should content be presented in the dialect of the child? In what language or languages should material be presented to non-English speaking or to bilingual children? Attention has recently been devoted to these questions, but still more is needed. An urgent subject for research is that of comprehension of standard English syntax by children who speak non-standard English. While these children might understand, for the most part, the standard English of the teacher, there may very well be some misunderstanding of the basic syntax or at least a failure in communication because of the speed or complexity of the linguistic and syntactic structure. Measures of comprehension of syntax which proceed beyond simple indications of sentence and clause and the like are badly needed.

Many kinds of measures for increasing the relevance of education to the world outside the classroom are being tried. Visits to the classroom by people from the community and trips outside the classroom are being increased. Lengthy research projects or apprenticeships conducted by students within the community are more frequent. The potential of measures such as these needs far more exploration.

Another feature which is primarily part of the world outside the classroom but which can be used both inside and outside the classroom for educational purposes is television. Many studies suggest that television is and can be an influential educational force. Far more research is needed to specify how various kinds of programs, lengths of exposure, and types and ages of children interact to produce changed behavior in children. We need to further investigate what levels of information and types of content can be effectively conveyed by TV. We need to look at transfer and long-term retention of learning from TV. We should evaluate the extent to which TV can provide for the active involvement of the child and feedback to the child about his responses. We need to determine TV's present and potential impact on attitudes and motivation and the role of TV as a source of behavior models. What is the present and potential influence of parents on children's viewing habits and tastes and on their comprehension and retention of televised material? We need to consider whether in terms of both cost and retention TV is the most effective means of carrying out a given task.

Staff

We have some knowledge about the impact on children of teacher characteristics and behavior. We need to obtain more of such information, especially through direct observation of contingencies between teacher and child behavior. Selection and training procedures need to be worked out in the light of information about desirable teacher characteristics. We need further development of ways to disseminate information about educational innovations, particularly to inservice teachers and supervisory educational personnel.

In connection with the many current and proposed innovations in education, the role of the teacher needs to be re-examined. What can teachers do better than any other educational resources? What do we want the role of teacher to be? What new groups of people can be used as part of the teaching staff? For example, how does the use of paraprofessionals, parents, and older children

in the classroom work out? Answers to questions such as these are just beginning to be looked for.

Social and Health Programs and Institutions

We need to consider the nature of the relationship between helping organizations and their clients. Do helping organizations alienate their clients and foster dependency by their size, complexity, and modes of operation? What can be done to develop participatory democracy by the clients themselves?

There are many social and health programs set up to directly benefit children which need further development and whose impact on children needs further assessment. The search for effective short-term and relatively inexpensive mental health therapy for children should continue, with greater emphasis on developing techniques of very early intervention. There is a need for more studies of the short- and long-term effects of established and experimental forms of mental health therapy for children. We need further definition in terms of reliability and validity of most of the screening tests used for identifying physical health problems. More work is needed in developing and assessing educational programs for accident and illness prevention. Day care of various forms needs further development and the impact on children of various forms of day care must be examined, particularly that of typical, non-university-based centers and home day care. More work is needed in devising training, including career development programs, for professional and paraprofessional child care workers and measuring the effectiveness and impact on children of new training and job opportunities in the field of early child care. Physical recreation facilities and programs as well as cultural activities for children need more attention.

There are many social and health programs and institutions of long-standing or newly created which are not primarily for children's benefit but which do affect children's lives. Examples include employment and job training for adults, the social welfare program, income maintenance, housing, and family planning. Study of the impact of these programs on children is recommended.

Child Advocacy

Pioneering efforts have recently begun to meet the need for community based organizations which represent the best interests of all children and which help bring about coordinated programs of child services. Many basic questions need to be answered concerning the establishment and maintenance of child advocacy mechanisms in a variety of settings. For example, which of such models as "in-house," "adversary," or "ombudsman" are most effective for which types of communities? What types of new services should be provided? What changes and additions are needed in the laws relating to children?

Total Life Space

The currently rising interest in the total life space of the child is part of the recent greater emphasis on a holistic research and development perspective. At the same time that authorities are urging assessment of the whole child and the development of programs which influence the whole child, they are likewise urging assessment of the total life space and the development of programs which affect many parts of the total life space.

There is an increasing amount of action programs which involve intervention at many points in a child's life. In respect to such programs, there is a need to compare the effects of different individual facets of intervention and of different combinations of facets. There is also a need to look at the effects of interaction between various facets of intervention and between intervention procedures and aspects of the child's life space which were not directly modified.

We need more research which examines the child's natural life space without trying to change it. In this type of research we need to increase the range of life space aspects examined. More consideration of the inter-relationships between these various life space aspects is also suggested.

Population Characteristics

Age

Certain age periods were mentioned as especially needing increased attention. Our knowledge about development between birth and 3 years of age, and particularly during the period from 1 to 3 years, is especially scanty. Development during the period from 1 to 3 years of age is of particular interest because this is the period during which the effects of psycho-social disadvantage first become evident. Researchers of late have begun to respond to this gap. Some sources also cited a special need for information about the cognitive and social-emotional development of adults in the middle years, particularly those between 20 and 29 years of age, the age group into which so many young parents fall.

Sex

There is presently a special focus and concern throughout the country on what the roles of the two sexes are and should be. In response to the current social concern and our scanty amount of knowledge about the development of sexual identity and sex roles, much more research is called for in this area, including research on the development of so-called deviant sexual behavior. We need to examine more closely the roles played in the development of sexual identity and behavior by such environmental influences as the family, peers, the media, the availability of birth control, and the educational system. Developmental differences between the sexes needs further consideration, such as the frequently found difference in the rate of language development. We need further examination of both the development of sexual identity and developmental differences between the sexes within different population groups, such as those of different socio-economic, cultural, and ethnic backgrounds.

Socio-economic Status and Ethnic Characteristics

Group Differences

We need to devote more attention to the growth of underlying abilities and specific cognitive skills in different socio-economic and ethnic groups.

In particular, there is a need for more specific and precise definition of socio-economically disadvantaged populations. Research is needed on the specificity or generality of deprivation effects. Is there a general deprivation syndrome? The research suggests a good deal of generality, but the matter is still an open empirical question. Research on the disadvantaged needs to be expanded, both in population and context. Heavy concentration on the school context and the school age range has resulted in a narrow empirical base. For example, we need studies of older disadvantaged people, of a wider variety of disadvantages, of those only slightly disadvantaged, of those disadvantaged in subtle and private ways where public stigma is not necessarily involved.

Causes of Differences

The causes of differences in performance levels and characteristics between different socio-economic and ethnic groups is an open, researchable question. We need heritability studies on various skills and characteristics within as well as between these different groups. We also need to know more about the environments of various ethnic and socio-economic groups.

In particular, many issues concerning the environment of the poor need to be addressed. Is there a culture of poverty or are the social and psychological correlates of poverty merely the normal outcomes of social stratification? We need ecological studies of various aspects of the context of disadvantage, such as study of the ecology of success and failure, of affection and rejection, of deviant and conforming role models, of abstract and concrete discourse, of negative sanctions and positive support for deviance. It is necessary to determine to what extent the social handicaps of the several disadvantaged groups are related to their "disabilities" and other personal characteristics per se, and to what extent to the social definition of these elements, i.e., to the stigma associated with these characteristics. In trying to gain a greater understanding of the effects of disadvantage, we might learn a great deal from historical and cross-cultural studies of poverty and studies of advantaged groups and those who have succeeded in spite of apparent disadvantage.

Social Programs

Programs which are attempting to improve the life outcomes of those living in disadvantaged environments need to concentrate not only upon means for directly effecting changes in behavior but also upon means for making crucial changes in the environment of these individuals. Programs involving multiple intervention techniques are being urged and are increasing. We need further work in trying to determine the most effective methods of involving the disadvantaged in the decision-making and running of action programs.

Study is needed of the effect of various media, and of TV especially, upon the self-concept, aspirations, and cultural knowledge and identity of disadvantaged and of minority ethnic groups.

Both integration and the establishment and maintenance of cultural identity are very live issues in our society at present. What is the inter-relationship between these two processes? Is an increase in one necessarily associated with a decrease in the other? These are questions which need much thought by all concerned and more research attention.

Geographic Location

Further attention is needed to determining cognitive, social-emotional, and physical differences between children living in rural, urban, and suburban environments; in different regions of the country; and at different altitudes. We need more comprehensive and detailed ecological information about these different environments. It would be of interest to examine what influences, if any, various media, and TV especially, have had on regional differences. In addition, the effects of moving from one type of geographic location to another need further study.

Capabilities

A great deal of attention has recently been devoted to assessing the abilities of the educationally retarded. We need to increase the amount of attention devoted to those of average and above average abilities.

The abilities of various exceptional groups of the population -- those with various handicaps or exceptionally great abilities -- need further specification. For instance, it was suggested that within the many categories

of mental retardation, distinct syndromes should be further identified. Various kinds of giftedness should be distinguished and explored in greater detail. More work should be devoted to assessing the impact of special abilities or disabilities on the whole child.

Educational, recreational, and cultural programs for exceptional populations need further development. Further consideration should be given to how programs for special groups can best be coordinated with programs for those in the average range of abilities. More attention needs to be devoted to the functioning of families which have one or more members with exceptional abilities.

Overview of Recommended Directions for Early Childhood

Research and Development

Various research and development recommendations are in line with an increasingly holistic and broad-range perspective, such as pleas for more comprehensive theories, for assessment and programming which take into account the whole child in his total life space, and for inclusion of a broad spectrum of the life span and the population. It is also recommended that planning, participation, and information-sharing in relation to early childhood research and development be expanded and modified so as to include a wider range of people and more cooperation and coordination between the different parties involved.

There is also an interest in using research and development techniques which will give us more focused, differentiated programs and results. For example, it is urged that the various components of cognitive and social-emotional development be further specified and studied. Finer breakdowns of such population groups as the disadvantaged, the handicapped, and the gifted are called for. Specification of contingencies between environmental input and behavioral output in both natural settings and applied programs is recommended. More instruction to meet individual needs and abilities and programs and tests which are relevant to particular cultural and ethnic backgrounds are urged.

In summary, then, the major directives for the future are for an increasingly holistic, broad-range, integrated overall framework within which are used methods which result in increasingly focused, differentiated results and programs.

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